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ALCO

Motor Trucks

1913

BOOK OF
INSTRUCTIONS



Class TL 230

Book . A4

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Motor Truck Book *of* Instructions



1913

AMERICAN LOCOMOTIVE COMPANY
1886 Broadway, New York

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NEW YORK

FOREWORD

THE ALCO TRUCK is nothing more or less than a piece of time-saving machinery. It is a machine--like a locomotive, an elevator, a cash register or an adding machine. As such it should be treated.

Its owner, or driver, should learn how to drive it skilfully, how to take care of it, when and how to lubricate it, how to get the most out of a gallon of gasolene, or oil, how to load a truck evenly, and so on.

He should study the truck and its mechanism. He should learn the mechanism and the theories of its working units-- as an engineer does his locomotive.

He should realize that in order to have the truck pay the largest returns he should keep it moving as much as possible. A truck waiting to be loaded or unloaded is not earning money for its owner.

At the same time he should realize that vibration is a factor of paramount importance in determining the maximum speed and load which may be prudently attempted. Vibration, in fact, determines the very life of the truck itself. The governor is adjusted at the factory for the maximum truck speed, but it is perhaps needless to say that the truck should not be run at this speed on rough roads.

He should know the rules of the road and the laws of automobile traffic.

If he does all this, he will find his truck a much better servant, a harder and more enduring worker and a better friend.

RECEIVING THE TRUCK



How the wheels are moored in the freight car

AN ALCO TRUCK is usually shipped to the dealer through whom it is purchased. He will take it off the freight car for you. He will deliver it to you in running order.

It is necessary only to fill the gasoline tank, the radiator, and the oil reservoir. Inspect the transmission to see that it contains lubricant, and fill each grease cup. Your truck is then ready for service.

If the truck is sent to you directly, the following is the best method to unload the truck from the freight car.

Chassis—trucks without bodies—are shipped from the factory to you in automobile box cars. These cars have end doors.

Complete trucks—those with bodies—are shipped on flat cars.

Do not put gasoline in the tank until the truck is off the freight car and on the ground. Always move

the truck by hand power. In unloading, always back the truck; never run it forward. It unloads easier backwards.

Unloading Chassis from Box Cars Never attempt to get a truck chassis out of the side door of a box car. It is impossible to get it out that way. If there is a platform upon which to unload the truck, see first that there is an empty flat car in the rear of the box car.

After this has been arranged, open the end doors. Loosen the moorings which hold the truck to the car. These are located as follows: A block before and after each of the four wheels. Knock the blocks away.

Cut the burlap which is wound around a spoke of each wheel—the spoke nearest the floor. It is nailed to the floor on both sides of the wheel.

These are the only moorings.

Put skids or stout planks between the flat car and the box car.

Back the truck out of the end doors onto the flat car. Swing the front wheels around, and back the truck on the unloading platform.

Turn the truck so that the rear is towards the runway to the ground.

In backing the truck down the runway from the platform to the ground, be sure the descent is not too steep. If it is too steep, you are likely to damage the underside of the flywheel. See that the flywheel does not come in contact with the platform.

Let it roll down slowly. Control the speed by the brakes.

The truck is then ready for gasoline, oil and water. See that the transmission contains oil. Fill each grease cup. The truck can now be placed in service.

Where There Is No Unloading Platform Arrange so that the box car containing the truck is the last car or the first. This depends upon which way the truck faces in the car. Always back the truck out of the freight car; never run it forward.

When ready, open the end doors, and detach the moorings that hold the truck to the car.

These are located as follows: A block before and after each of the four wheels. Knock the blocks away.

Next cut the burlap which is wound around a spoke of each wheel—the spoke nearest the floor. The burlap is nailed to the floor on each side of the wheel.

These are the only moorings.

Place skids or stout planks from the car to the ground. Prop the skids well. Be sure that the descent is not too steep. You may injure the flywheel if the descent is too steep. Be careful and see that the flywheel does not come in contact with the edge of the car.

Let the truck roll down slowly. Control its speed by the brakes.

The truck is then ready for gasoline, oil and water. Fill the grease cups. It can now be placed in service.



Always back a truck out in unloading

Unloading Unload the truck the same as per the above.
Complete Trucks Having unloaded the truck from the freight car, be sure
that the truck is equipped with the following accessories,
which are standard:

- 2 oil side lights.
- 1 oil rear light.
- 1 bulb horn.

In the tool box should be the following:

- 1 wrench for cylinder plug and tank cap.
- 1 spanner wrench for clutch nut.
- 1 socket wrench.
- 1 wrench for axle nut.
- 1 lubricant gun.
- 1 oil can.
- 1 screw driver.
- 1 ball peen hammer.
- 1 cotter pin puller.
- 1 nickel plate combination gas pliers.
- 1 barrett jack, No. 13 (the handle will be found under the front seat).
- 1 18-inch monkey wrench.
- 1 file and handle.
- 1 solid punch.
- 1 nut pin wrench.
- 1 padlock.

And the following parts:

- 1 valve spring washer key.
- 1 valve spring.
- 1 inlet and exhaust valve.
- 2 spark plugs and miscellaneous nuts, bolts, cotter pins, and lock washers.
- Book showing price of parts.

See that you receive all these with your truck. They are part of its equipment.

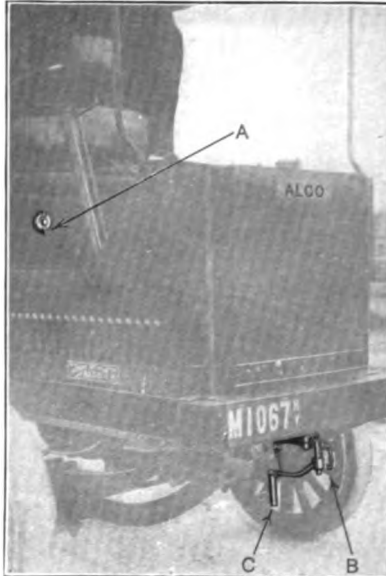
HOW TO OPERATE THE TRUCK

Getting Ready to Start Fill the gasoline tank (directions on page 29). It holds 26 gallons. Put water in the radiator (page 35). Fill the oil reservoirs in the motor and transmission and all grease cups (page 15). Turn on gasoline (see page 29).

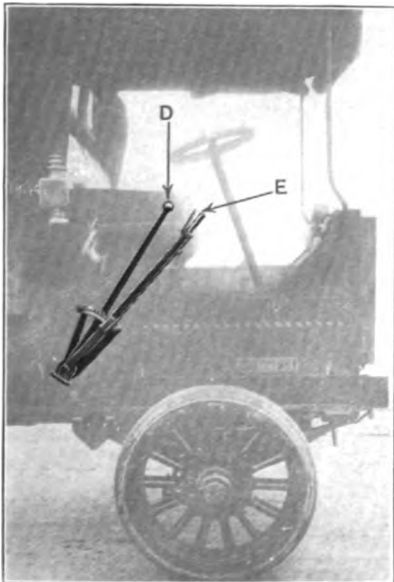
How to Start Motor Pull the hand brake—the outside lever (E)—backward as far as it will go. Push the inside lever (D) so that it is midway—between both ends of its throw—in a neutral position.

On the left side and under the steering wheel are two levers. Push the one that is on top (1)—the spark lever—away from the driver's seat, about one-half inch—no further.

Push the one that is on the bottom (2)—the throttle lever or



A starting coil and switch; B compression release lever; C starting crank



D gear shift lever; E hand brake lever

gasolene control—about one and one-half inches away from the driver's seat.

Prime the carbureter. This is done by pushing down button (3) on the carbureter. Do this until gasolene starts to drip from the carbureter.

Under the seat on the right hand side is the switch (A). On this are the letters "M," "A" and "B." Turn the switch so that the part marked A will be opposite B. Push the button in the middle (4) two or three times.

Raise up and pull out lever (B)—the compression release. Engage handle (C)—starting crank—with the lugs and *pull up* always. Never push down. Do this three or four times until motor starts.

When motor is cold it may be necessary to prime the cylinders

before starting. Open the cylinder petcocks and place about half a teaspoonful of gasoline in each. Close the petcocks before cranking.

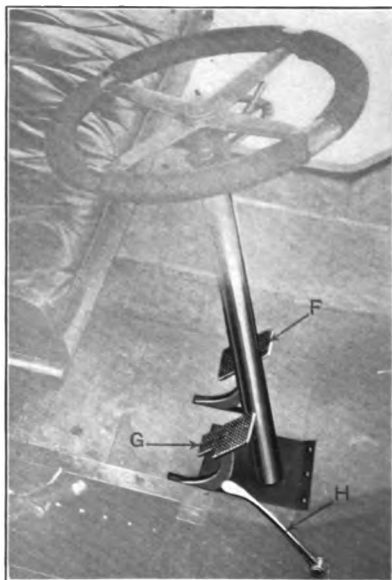
Should motor refuse to start after reasonable cranking, look for the trouble. On page 23 are enumerated the reasons for the motor refusing to start and how to overcome the difficulty.

If you have no batteries, or they are not connected up, and you wish to start on the magneto, turn the switch (A), under the seat, so that the letter "A" is opposite "M."

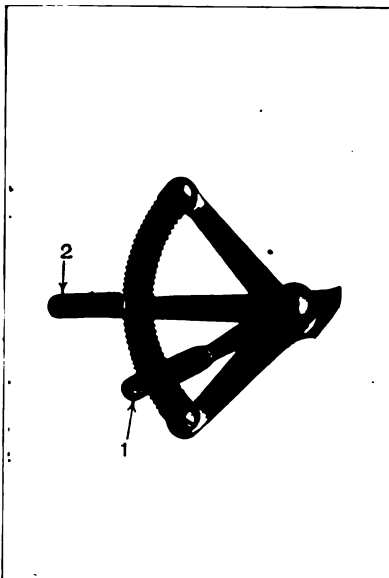
Push the spark lever (1) under the steering wheel, as far away from the driver's seat as possible. Push the throttle (2) about one and one-half inches away from the driver's seat.

Prime carbureter as described on the previous page.

Raise up and pull out compression release lever (B) and spin the motor.



F—Clutch pedal; G—Brake pedal; H—Accelerator pedal



Correct position of control levers before cranking.
Spark control (1) and throttle control (2) for cranking

After Motor Is Started Quickly raise up and push in compression release lever (B).

Turn the switch so that the letter "A" is opposite "M." Pull the throttle (2)—the lower lever under the steering wheel—towards the driver's seat until it is about one-half inch away from the end nearest the driver's seat.

Push the other lever (1)—the spark lever—as far from the driver's seat as it will go. (See diagram on page 11.)

Getting in Motion Release the hand brake (E)—the outside lever. With your left foot push down the foot pedal which is on the left of the steering wheel (F)—the clutch pedal—as far as it will go. Hold it there.

Pull the change speed lever (D)—the inside lever—into the

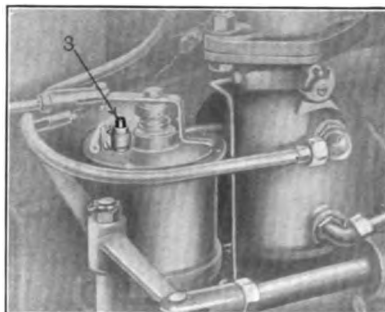
back inside slot (see page 36), as far as it will go.

With the right foot push down lightly on the little pedal to the extreme right of the steering wheel post (H)—the accelerator. Hold this down.

Lift up your left foot very slowly and steadily.

The truck now moves.

Lift your right foot off the accelerator pedal (H).



Showing the location of the priming valve on the carburetor

Changing into Higher Speeds In changing into higher speeds, always go through the regular order. When starting, start on first, proceed into second and then into third.

To Go from First into Second Speed With the right foot push down the accelerator—the little pedal to the extreme right—until the truck moves twice as fast.

With the left foot push down the clutch pedal and hold it there.



The normal position of the starting switch and coil

Release the accelerator pedal under the right foot, and push the change speed lever into second speed—the outside front slot.

Release the clutch pedal under the left foot—slowly and steadily.

All this must be done quickly, so that the truck does not lose its headway.

If it is done too slowly, you are likely to "stall" the motor.

In other words, the truck loses its momentum, and when the clutch is thrown in, the strain of the higher speed is so great that the motor stops.

To Go into Third Speed Accelerate the motor as heretofore. Throw out the clutch, pressing down on the clutch pedal. Pull change speed lever as far back as it will go.

"Do not over-load; do not over-speed"

Use third speed generally for driving. If pavement is wet or slippery, use second speed.

On hills, if you are in doubt, use first speed. The speed to use on hills you can learn only by experience.

Much depends on the load, the condition of streets, and so on.

How to Drive Sit comfortably back in the seat.
(on High Speed)

Hold the steering wheel gently but securely with both hands.

It is not necessary to grip the wheel; the truck won't run away.

Always keep the left foot lightly on the clutch pedal. Do not let weight of foot rest on the pedal.



The wrong way to crank—never push down

You can control the truck by the clutch pedal. If there is something in the way, or if it is necessary to slow down—merely throw out the clutch pedal.

If a short and quick stop is required apply the foot brake.

If you have a clear road ahead, and you want to take advantage of it, merely push down the accelerator to the floor board—lightly.

Always keep cool. If you are in a tight place and not certain what to do, push down with your left foot, thus throwing out the clutch.

The truck can't run away from you. It is under your control.

Don't try to stop the truck too quickly with the emergency brake. Use it when leaving the truck standing.



The right way to crank—always pull up

"Do not over-load; do not over-speed"

"Do not over-load; do not over-speed"

It is necessary that you pull up on the change speed lever when engaging reverse. A notch prevents it from being engaged unless the change speed lever is pulled up. This prevents reverse speed from being at any time engaged accidentally.

Racing the Motor Never "race" the motor to the limit of the governor.

By this is meant making the motor go at a terrific speed with the clutch thrown out. This wears out the bearings and places unnecessary strain on the crankshaft.

The governor controls the speed of the motor. It allows the motor to make a certain maximum number of revolutions per minute and no more. The governor operates automatically.

The maximum number of revolutions of the different capacities of Alco trucks is as follows: 2-ton, 1,000 revolutions per minute; 3½-ton, 850 revolutions per minute; 5-ton, 1,000 revolutions per minute; 6½-ton, 900 revolutions per minute.



The correct position for driving; note the position of hands and feet



The wrong position for driving; note the position of hands and feet

After careful investigation, our transportation engineers have found that the truck is most efficient with the motor governed to this rate of revolutions, and it should at no time be disconnected.

Stopping the Motor Push the throttle about half way from the driver's seat.

Leave spark in same position.

Turn the switch so that the letter "A" is centered between "M" and "B"—in a vertical position.

The motor will now stop.

Throw on the hand brake.

"Do not over-load; do not over-speed"

WHAT TO DO EVERY MORNING

Fill gasolene tank.
Fill oil reservoir in motor.
Fill radiator with water.
See that grease cups are full.
See that all parts are in working order.
Test the batteries.
Test the spark plugs.
See that the brakes are in good condition.
Clean the glasses of the lamps and trim the wicks.
Pour liquid grease on the chains.

Give the following grease cups one complete turn:

(See chart on page 15.)

- 1—on fan bracket.
- 2—on pump driving shaft.
- 3—on spring bolts.
- 5—on steering gear case.
- 8—on pump.
- 9—on pump.
- 12—on steering knuckle.
- 15—on steering universal joint.
- 16—on steering rod end.
- 19—on pedal shaft.
- 20—on clutch shaft.
- 22—on spring bolts.
- 23—on change gear and brake shaft.
- 24—on clutch fork collar.
- 27—on brake shaft.
- 28—on brake shaft.
- 39—on differential shaft bearing
- 40—on radius rod clevis.
- 41—on radius rod clevis pin.
- 42—on spring bolts.
- 43—on hand brake countershaft.
- 45—on hand brake countershaft.
- 47—on brake anchor.
- 48—on radius rod.
- 49—on brake anchor.
- 52—on spring bolts.

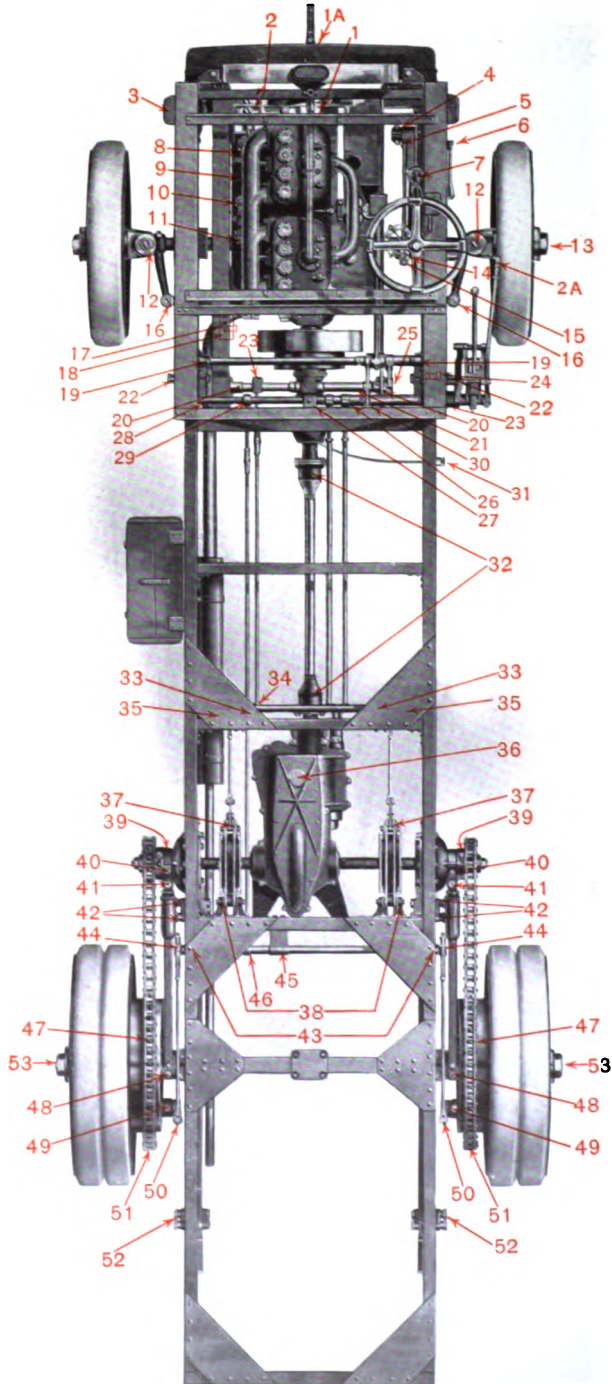
A few drops of oil should be applied to:

- 1a—starting shaft.
- 6—accelerator shaft.

The following places should be greased:

- 7—steering post bracket.
- 31—clutch shaft bearing.
- 33—foot brake countershaft.

"Do not over-load; do not over-speed"



Where to lubricate the truck

INSTRUCTION FOR LUBRICATION

DAILY

Oil

- 1a Starting shaft.
- 6 Accelerator shaft (2 places).

Liquid Grease

- 51 Chain (2 places).

Grease

- 1* Fan brackets.
- 2* Pump driving shaft.
- 3* Spring bolts (2 places).
- 5* Steering gear case (2 places).
- 7 Steering post bracket.
- 8* Pump.
- 9* Pump.
- 12* Steering knuckle (2 places).
- 15* Steering universal joint (2 places).
- 16* Steering rod end (2 places).
- 19* Pedal shaft (2 places).
- 20* Clutch shaft (2 places).
- 22* Spring bolts (4 places).
- 23* Change gear and brake shaft.
- 24* Clutch fork collar.
- 27* Brake shaft.
- 28* Brake shaft.
- 31 Clutch shaft bearing.
- 33 Foot brake countershaft (2 places).
- 39* Differential shaft bearing (2 places).
- 40* Radius rod clevis (2 places).
- 41* Radius rod clevis pin (2 places).
- 42* Spring bolts (4 places).
- 43* Hand brake countershaft (2 places).
- 45* Hand brake countershaft.
- 47* Brake anchor (4 places).
- 48* Radius rod (2 places).
- 49* Brake anchor (4 places).
- 52* Spring bolts (4 places).

WEEKLY

Oil

- 2a Hand brake trigger (2 places).
- 4 Throttle lever pins (3 places).
- 10 Magneto.
- 11 Magneto.
- 14 Throttle lever pins (2 places).
- 17 Ignition bracket (3 places).
- 18 Ignition lever pins (5 places).
- 21 Clutch shaft.
- 25 Brake lever link (2 places).
- 26 Change speed lever (2 places).
- 29 Brake lever.
- 30 Clutch lever link (2 places).
- 34 Foot brake countershaft lever.
- 35 Foot brake countershaft lever (2 places).
- 37 Brake lever pins (6 places).
- 38 Brake shoe pins (4 places).
- 44 Hand brake countershaft lever, inside.
- 50 Brake lever pin (2 places).

MONTHLY

Grease

- 13 Front hubs (2 places).
- 32 Universal joint (2 places).
- 53 Rear hubs (2 places).

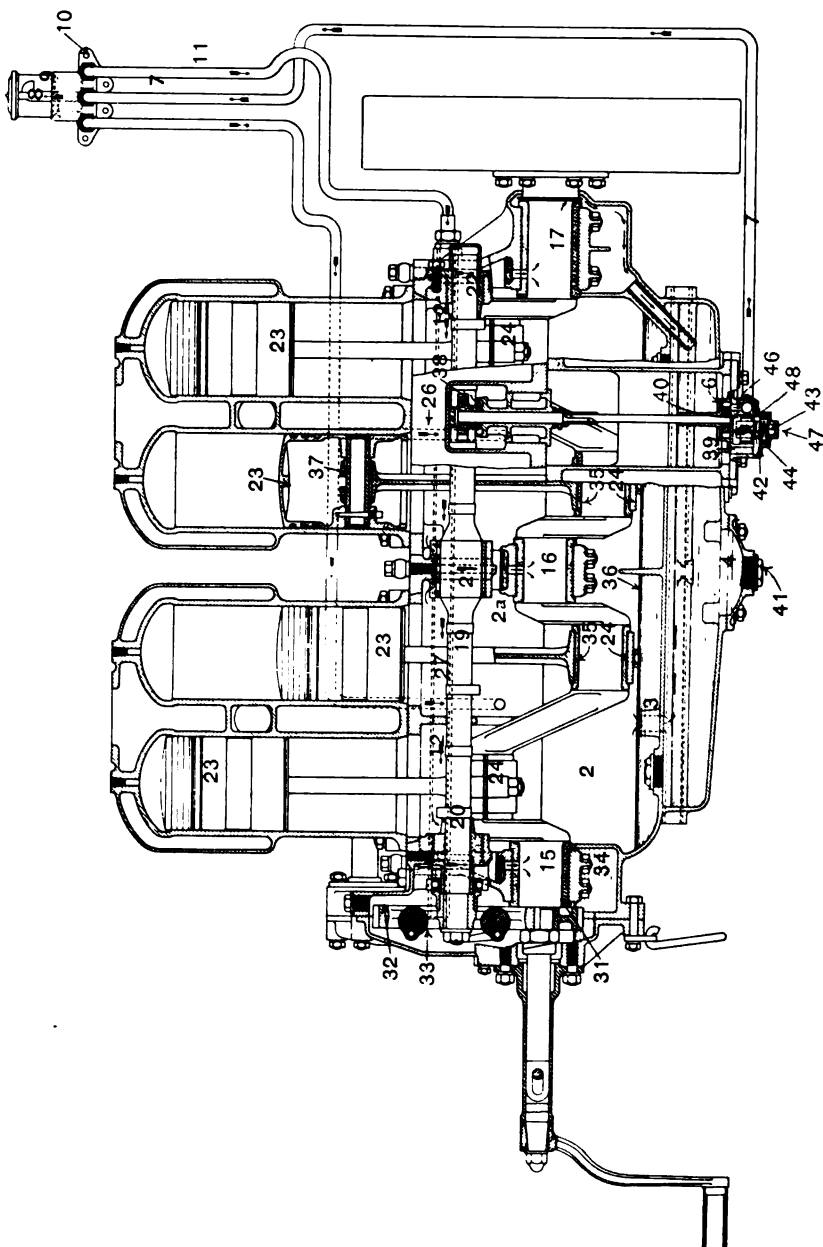
EVERY TWO MONTHS

Grease

- 36 Gear case.

* Grease cups—to be turned once. All grease cups to be filled when empty.

"Do not over-load; do not over-speed"



Oiling system of motor—side view

"Do not over-load; do not over-speed"

LUBRICATION

Importance Perfect lubrication is essential to operate a motor truck successfully. Most troubles are due to neglect of lubrication.

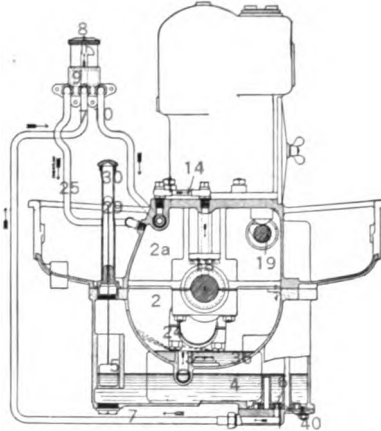
The Alco has a sight feed on the dash, so that you can tell if the motor is being thoroughly lubricated while you are driving. If perfect lubrication were not essential, the engineers of the Alco would not have gone to this expense.

Pay strict attention to your lubrication. On page 15 there is a schedule which must be carefully carried out.

After every 300 miles, drain out the oil reservoir (4) and crankcase (2).

Refill with new oil.

If this is not done, the bearings will be injured. This often necessitates repairs that might have been avoided.



Oiling system of motor—front view

MOTOR

System Used Force feed and splash is used to lubricate the parts of the motor.

There is a sight feed on the dash, through which all the oil must pass on its way to the motor.

If the oil stops running through this feed the driver can tell immediately that the motor is not receiving the proper amount of oil.

He can remedy it before any great damage is done.

After the motor is started, the oil pump (6), which is geared to the motor, forces the oil from the reservoir (4).

From there the oil is forced up through the pipe (7) and the standpipe (9) in the sight feed on the dash.

The oil then flows through oil feed (10), down pipe (11) to the oil channel (12).

This oil channel is cast in the crankcase (2a).

When this channel (12) is filled with oil, the oil rises into the standpipe (13).

From there it flows through connecting pipes (14) to each of the three crankshaft bearings (15, 16 and 17).

Above each of the crankshaft bearings (15, 16 and 17) there is a cup-shaped channel (18).

This is used to hold a surplus of oil, which, should anything happen to the oil pump and place it out of operation, would enable the motor to run a considerable time before overheating.

The oil pump (6) is geared just high enough, so that when the motor is running slowly enough oil is supplied to the crankshaft bearings (15, 16 and 17) to cause a surplus.

This surplus of oil leaks through the bearings and splashes in every direction, thereby supplying efficient lubrication for the camshaft (19) and its bearings (20, 21 and 22).

This also supplies lubrication to the pistons (23). The pistons receive additional lubrication through the splashing of oil caused by the dipping of the connecting rods (24) into the oil in the crankcase (2).

As the speed of the motor is increased, the oil pump (6) delivers a greater supply of oil.

This causes a surplus too large to be used by the crankshaft bearings (15, 16 and 17).

Also, the delivery of pipe (11) is too small to carry the discharge from the oil pump (6).

The oil then rises in the sight feed (8) about half way.

It consequently flows into overflow pipe (25), which is large enough to care for any surplus of oil.

It delivers this surplus back to the crankcase (2), through pipes (26 and 27).

This surplus then runs through the overflow pipe (3) into the overflow reservoir (4).

Hence, there is always a constant level maintained in the crankcase, no matter what the speed of the motor may be.

When the speed of the motor is retarded, no oil flows through the overflow pipe. Even when the motor is stopped, there is at all times oil in the cup channels (18).

Upon starting the motor, the crankshaft bearings (15, 16 and 17) receive the lubrication from these channels until the motor is running and the oil pump (6) forces the lubrication into circulation.

The float (5) is so arranged that when the cork tell-tale (29) is at the bottom of the opening in upright tube (30) the oil pump (6) has no oil to circulate. Consequently, the sight feed (8) on the dash tells the operator that the reservoir is empty.

The timing gears (31 and 32) in front case (33) are lubricated from the oil reservoir (34).

This reservoir receives its supply from the overflow of the crankshaft bearing (15).

The gear (31) dips into this oil and carries the oil to the gears in mesh with it.

That gear carries the oil to the next gear, and so on. Every gear in the front case thereby receives lubrication.

The big end bearing of the connecting rod (35) receives its lubrication through the dipping of the connecting rod (24) in the oil supply (36) in crankcase (2).

With the splashing resulting from the dipping of the connecting rod into the oil, the oil reaches into channels, holes and grooves cut into the connecting rods (24) and big end bearings (35).

The lubrication of the top connecting-rod bearings (37) is received from oil which collects on the side of the cylinder walls and is transmitted through the piston (23) to the bearing (37).

They also receive lubrication from the splashing of oil in the crank case.

The oil passes from the sump (4) in the crankcase to inlet passage (39), and passage (42), then to settling chamber (43). It is then drawn through screen (44), and passage (45), to the oil pump (6), which discharges the oil through the passage (46), to pipe (7).

The settling chamber (43) and screen (44) can be cleaned by unscrewing cap (47) and withdrawing the screen (44). Unscrewing the cap (47) causes the cut-off sleeve (48) to descend and cover the passage (42), preventing the escape of oil from the sump (4). On replacing the cap (47), the cut-off sleeve (48) returns to its former position, allowing the oil to flow through passage (42).

This system is fool-proof, for as long as there is oil in the reservoir, every part of the motor will be thoroughly lubricated.

How to Fill On the left side of the motor—the carbureter side—and to the right of the carbureter is a pipe. This comes up about even with the bottom of the carbureter.

Unscrew the cap on top of it.

Pour oil into this pipe.

This reaches the crankcase and reservoir for the motor.

On the left of the carbureter is a gauge. Oil should be poured into the crankcase until the float in the gauge reaches the top of the gauge.

How to Tell When in Need of Oil Every morning before you start out, fill the motor crankcase until the float in the gauge is up to its highest point.

While driving look at the sight feed on the dash now and then and see that oil is running through it. If it is not running, see by the float in the oil gauge if there is need of oil in the crankcase.

How to Drain Oil Under the motor, about the middle, is a plug. Unscrew this to drain the oil out of the motor.

TRANSMISSION

System Used The gears in the transmission case run continuously in oil. The splash caused by the revolving of the gears lubricates the ball bearings.

Kind of Oil to Use A good grade of heavy, black cylinder oil is recommended as best adapted to the transmission.

Every 3,000 miles or every two months of the operation of the truck, the oil in the transmission should be drained and the transmission case flushed with kerosene.

Refill it, then, with new lubricant.

How to Fill with Oil In the forward end of the transmission there is a sliding cover which works on a pinion. It is held in place by a thumbscrew. Unscrew this and push the slide toward the front of the truck.

Pour oil through this until it is one-half full—one-quarter inch below the top of the shafts on which the gears operate.

Push the slide over the hole.

Tighten the thumbscrew so that the cover will not slide open.

If the cover slides open, dirt is apt to get into the oil and cause trouble.

How to Tell When in Need of Oil When gears grind, or make a whirring noise. When noiseless no oil is needed.

How to Drain Oil Unscrew plug on the bottom of the transmission case.

WHEELS

The wheel hubs should be packed in heavy grease. The grease should be renewed once each month.

In order to pack the wheel hubs it is necessary that the wheel be taken off.

To take off the wheels: First unscrew and take off the hub cap. Pull out the cotter pin. Unscrew the nut and pull off the wheel.

To take off the rear wheels, disconnect the chain by pulling out the cotter pin of one of the links and disconnecting the link.

MOTOR

General Principles There are four strokes of the piston in a four-cycle motor to complete the delivery of power to the rear wheels.

They are as follows:

The first stroke is a downward one, which sucks the gas from the carbureter.

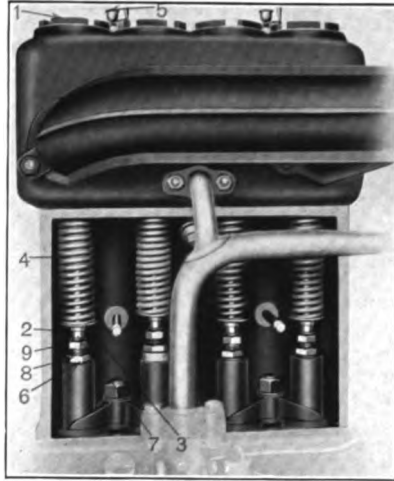
The second is an upward one that compresses the gas in the cylinder.

The third is a downward stroke caused by the spark plug igniting the gas. The gas explodes in the cylinder and forces the piston down. This is the power stroke.

The fourth is an upward one, which forces the exhaust, after the gas is exploded, out of the cylinder into the exhaust manifold, or pipe and muffler.

Lubrication (See page 17.)

Care of the Motor The motor is the "life" of your motor truck. Don't abuse it, overload it, or "race" it, if you expect it to work properly.



Section of motor with cover plates off, showing the valves

Always keep the oil reservoir in the motor full.

All you have to do is to see that oil flows through the sight feed on the dash, when the motor is running.

Always make sure that there is water in the radiator and that the fan is working.

If any engine trouble develops, locate the trouble immediately. It will save you much time and attention later on.

Always keep the brass and other parts of the motor clean.

See that the spark plugs are kept clean.

Grind the valves once or twice a season.

If a nut, bolt, or any part is loose, tighten it immediately.

In short, treat your engine right and you will get faithful service in return.

Compression Release This relieves the compression by slightly lifting the exhaust valve. It should always be in when motor is running.

Removing Carbon This should be done by an expert mechanic.

Remove valve cap (1) on top of cylinder. Raise piston in cylinder as high as it will go. Scrape off the carbon from the top of the piston and cylinder with a scraper.

How to Remove Valves Remove the valve cap (1) directly above each valve.

Remove the key (2) which is attached to the valve stem under the saucer (3) at the bottom of the valve spring (4).

The valve can then be readily taken out.

How to Grind Valves A mixture of oil and powdered glass is the best preparation for grinding the valves.

Rub this around the valve seat and the seat of the cylinder until it shines equally all around.

Care should be exercised to not let this mixture get into the cylinder, as it is liable to wear the sides of the piston rings and cause loss of compression.

How to Test the Compression Before testing compression, be sure that the compression release handle in front of the truck is in.

Turn the starting crank slowly until resistance is felt and overcome.

Do this in turn with each cylinder.

If the resistance is less in one cylinder, or if all the cylinders are weak, it may be because the piston rings are gummed or because of a leakage past the valves.

The application of a tablespoonful of kerosene through the petcocks (5) of each cylinder, when the engine is warm, will usually remedy this.

The motor should be turned over briskly by hand several times.

It should then be allowed to stand over night if possible.

Timing Valves Valves are properly timed at the factory and do not need timing.

Valve Adjustments Place a business card between the push rod (6) and the valve stem (7). Turn lock nut (8). Turn nut (9) so that the business card can be pulled out easily. Do not have the distance between the valve stem and push rod great enough for the card to fall out.

TROUBLES AND REMEDIES

Engine Refuses to Start

Causes—

Foul or cracked spark plugs.
Lack of gasolene in carbureter.
Improper gas mixture.
Improper ignition.
Poor compression.
Water in gasolene.

Switch not in contact.
Broken circuit.

Remedies—

Clean or renew plug.
Prime carbureter.
(See page 31.)
(See page 27.)
(See page 22.)
Drain gasolene tank and refill,
straining gasolene through
chamois.
Turn switch to "B."
(See page 27.)

Motor Smokes

Causes—

Too much oil in crankcase.
Broken piston rings.

Remedies—

(See page 19, How to Drain Oil.)
Renew piston rings.

Motor Overheats

Causes—

Clogged radiator tubes.
Clogged muffler.
Incorrect timing of valves.
Over-retarded spark.
Lack of oil.
Over-racing of motor on low speed.
Water pump not working.
Not enough water in radiator.
Fan belt disconnected.

Remedies—

(See page 35.)
Disconnect muffler.
(See page 22, Valve Adjustments.)
Fill reservoir in motor.
Advance spark.
Locate trouble.
Fill radiator.
Re-connect.

Motor Knocks

Meaning—

Gradual slowing up of motor followed by mis-fire.

Causes—

Carbureter choked up with dirt
at jet.
Gasolene tank empty.
Foul spark plugs.
Gasolene leaking.
Inlet valves stuck while open.

Remedies—

(See page 33.)
Fill gasolene tank.
Clean spark plugs (see page 27).
Pour kerosene around valve stem.
Take out valve and clean (see
page 22).
Change to lower speed.

Overloading motor on high gear.

Loss of Compression

Causes—

- Valves carbonized.
- Not enough play between valve lifter and valve stem.
- Valve stem sticking in guides due to carbon
- Priming cock leaking.
- Broken piston rings.
- Spark plug leaking.

Remedies—

- (See page 22, How to Grind Valves and How to Remove Carbon.)
- (See page 22, Valve Adjustments.)
- Pour kerosene down valve stem guide.
- Close. Situated on top of each cylinder.
- Renew rings.
- Tighten.

Clutch Slips

Causes—

- Too much strain on clutch-pedal while clutch is engaged.
- Broken clutch spring.
- Clutch sliding shaft dry.

Remedies—

- Loosen tension on spring (see page 34).
- Renew spring.
- Lubricate—use solution of half gasoline and half kerosene.

Explosions in Muffler

Causes—

- Cylinder misfiring pumps explosive charge into muffler. This ignites from the heat of the next exhausted charge.
- Exhaust valve stuck, or does not seat properly.
- Gas mixture too poor to fire in cylinder.
- Release cams in action.

Remedies—

- (See pages 32 and 26.)
- (See page 22, How to Grind Valves.)
- (See page 32, Carbureter Troubles and Remedies.)
- Push in compression release in front of truck.

Engine Stops Suddenly

Causes—

- Broken spark plugs.
- Disconnection in electrical circuit.
- Insufficient spark.
- No gasoline.
- Broken wire.
- Piston stuck.
- Lack of lubrication.

Remedies—

- Renew plugs.
- Trace up carefully and locate disconnection.
- (See Ignition, page 27.)
- Fill gasoline tank.
- Trace back carefully.
- Apply tablespoonful of kerosene through petcock of motor.
- Fill oil reservoir.

Engine Runs Smoothly, but Truck Drags

Causes—

- Clutch operating pedal not completely released.
- Brakes not completely released.

Remedies—

- Lift foot off pedal.
- Lift foot off brake pedal. Push hand brake lever forward as far as it will go. Adjust brakes if necessary.

Cylinder Missing

Irregular explosion of gas in cylinder.

Causes—

If in all cylinders, carbureter adjustment wrong.

Ignition system from magneto to spark plug short-circuited. Magneto weak.

If in one cylinder: To locate cylinder that is missing: Start motor in regular way. Turn switch on magneto. Open the priming or petcock on top of the cylinders.

If the explosions occur in that cylinder regularly, close petcock. Open petcock on next cylinder. Do this to all cylinders until cylinder that is missing is located.

Remedies—

(See page 33, Carbureter Adjustments.)

(See page 27.)

Cause—

Foul or dirty spark plug.

Wire from magneto to spark plug short-circuited, caused by rubber insulation on wire wearing through.

Renew spark plug (see page 27).

Renew wire.

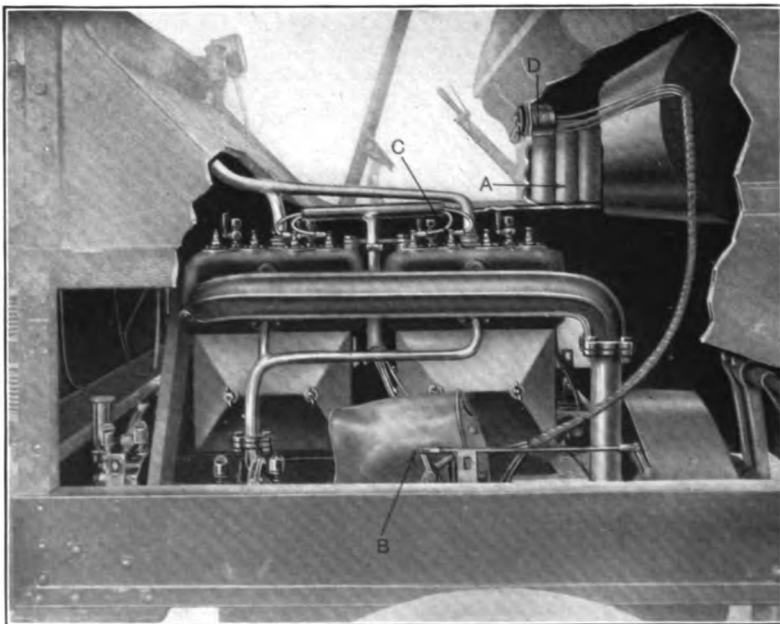
"Do not over-load; do not over-speed"

IGNITION

What It Is The switch (D), batteries (A), magneto (B), spark plug (C), and the wiring comprise the ignition system.

What It Does When a cylinder is filled with gas and the piston inside the cylinder is just about to descend after having compressed the gas, a spark occurs.

This explodes the gas in the cylinder, making the power.



Showing the ignition system and connections

System Employed Bosch Dual System.

Firing Sequence The order in which the spark occurs in the cylinders is 1, 3, 4, 2.

How to Tell When Ignition Is Not Working Engine will stop. Cylinder will "miss."

"Do not over-load; do not over-speed"

Troubles and Remedies Read the Bosch instruction book on High Tension Dual system for information on this subject. One of these books accompanies each truck. It is in the tool box.

Battery What it does: The batteries, located on the right-hand side under the front seat, supply current for a spark before the motor is running. They assist in starting and facilitate cranking.

When in need of new battery: When there is no buzzing sound upon pushing the button in the middle of the switch, while "A" is turned to "B."

How to connect batteries: (See illustration at bottom of page.)

Spark Plugs What they do: Cause the spark which ignites the gas. The steel points on the end of the spark plug—the ends on which the spark jumps from one point to other—should not be more than $\frac{1}{16}$ of an inch apart.

Where located: They are located on the top right-hand side of each cylinder.

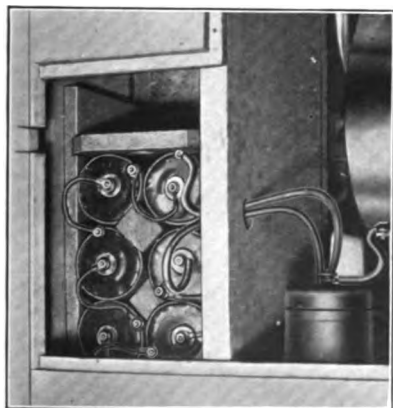
When in need of cleaning: Whenever motor misses, first look at spark plugs.

How to clean: (See "Sooting" below for instructions on cleaning spark plugs.)

Troubles and Remedies Porcelain breaks.

Causes: Expansion and contraction of the porcelain caused by overheating of the spark plugs.

Remedies: This can not be remedied, except by renewing porcelain on plugs.



Showing the battery connections

"Sooting."

Meaning: Soot collects on the insulation around the sparking ends of the steel points of the spark plugs.

Cause: Carbureter mixture too rich. (See page 32.)

How to clean: Take the spark plug apart. The method, of course, will depend on the type of spark plug used. Wipe off the carbon with emery cloth. The steel points—the sparking end of the spark plug—should be not more than $\frac{1}{16}$ of an inch apart.

Care of Spark Plugs The spark plugs should be cleaned at intervals.

Be sure that the steel points are not too far apart.

When steel points are too far apart: A spark will occur in the safety spark gap. This is located under the arch of the magnets on the magneto.

When spark plugs are sooty or foul: Cylinder will miss. (See page 25.)

Magneto What it does: It generates electricity and distributes it to the proper spark plugs.

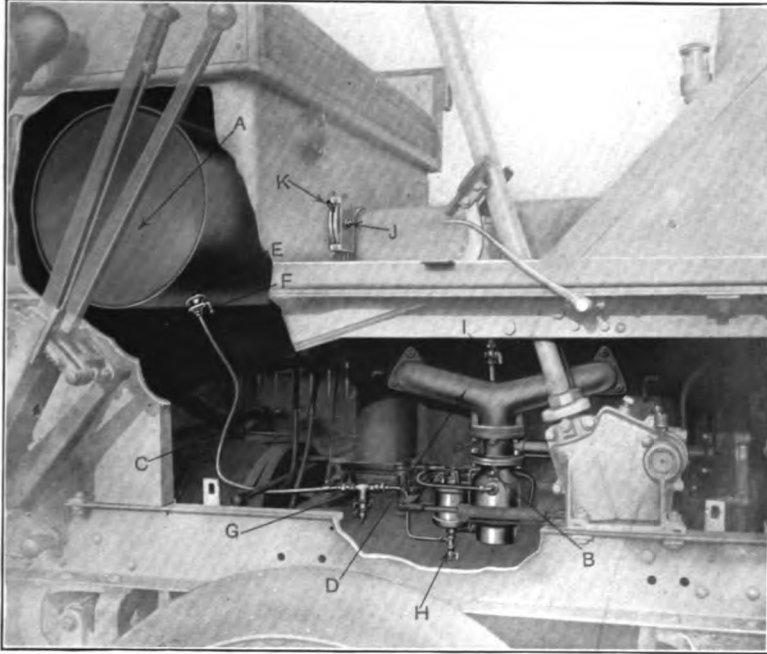
Where located: On the left side—the valve side of the motor.

Care: The only care the magneto needs is oiling. Oil the magneto in each oil hole. It requires only from eight to ten drops. Over-oiling injures the magneto. The outside should be kept clean from dust.

Troubles: If any trouble is experienced with the magneto, send it to the local office of the manufacturers or to the local Alco dealer. Do not attempt to make any adjustments yourself. Many good magnetos have been placed totally out of service on account of a wrong or an unnecessary adjustment.

GASOLENE SYSTEM

What It Is The gasolene system comprises the gasolene tank (A), the carbureter (B), the gasolene pipe (C), and the intake pipe or manifold (D).



Showing the gasolene system and connections

Gasolene Tank Location: Under seat.

Capacity: 26 gallons.

How to fill: Lift up cushions and seat boards, and unscrew cap. Always strain gasolene through chamois.

How to drain gasolene: Unscrew gasolene pipe connections (E) on gasolene tank.

How to Turn on Gasolene Underneath the gasolene tank, at the connections of the gasolene pipe to the tank, is a valve (F). Turn this so that the handle is parallel with the gasolene tank, with the end of handle pointing toward you.

How to Turn off Gasolene Turn valve (F) until the handle is parallel with the gasolene pipe.

When Mixture Is Rich Engine will "gallop": i. e., when running idle, it will pick up speed suddenly, slow down, pick up speed, etc. Mixture at exhaust pipe has a rather rich gasolene smell.

Remedy On 3½, 5 and 6½ ton trucks, the carbureter adjustment is under the seat (J—see page 29). At the top of the gauge is the word "Rich" and at the bottom is "Poor." Push the lever (K) one notch towards "Poor."

On two-ton trucks, the adjustment is on the carbureter. Push lever (L—see page 31) one notch towards "Poor."

When Mixture Is Poor Knocking in engine: i. e., a gradual slowing up of motor followed by a misfire.

"Bucking" of motor: i. e., the motor misses at a low speed or when "picking up" speed.

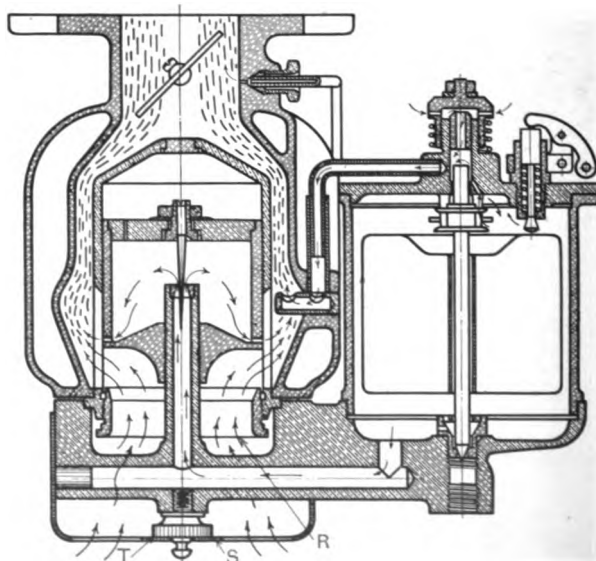
Pungent exhaust: i. e., when the odor from the exhaust is disagreeable.

Remedy On 3½, 5 and 6½ ton trucks, pull the lever (K) on the carbureter and adjustment under the seat (J—see page 29) one notch towards "Rich."

On two-ton trucks, push the lever (L—see page 31) on the carbureter one notch towards "Rich."

When Carbureter Is Flooding Gasolene leaks over the top and around the valve (M). (The button that is pushed down to prime the carbureter upon starting motor.)

Causes: The float may be leaky, in which case gasolene will find its way into it and increase its weight, thereby sinking it and preventing its action. The float may be too high.



Sectional view of carbureter

Remedy **How to fit in new float:** Remove nuts (N) on top of carbureter. Cover will now come off complete. Lift out float.

How to Tell When Mixture Is Right This can be determined by the action of the motor. It will run at all speeds without missing. It will run smoothly, developing its maximum power with the least fuel consumption.

How to Adjust If you are located near an Alco dealer, it is best to bring the truck to him for the necessary adjustments.

Before making adjustments to the carbureter, be sure that the ignition system is in perfect working order.

After this has been ascertained, proceed as follows:

Close the throttle: i. e., push lever 2 (see page 8) towards the driver's seat as far as it will go. See if the throttle lever (P—see page 31) is pushed as far as the stop on the carbureter permits.

Place lever (L) in the middle position. (See illustration on page 31.)

Turn up regulating collar (R) as far as it will easily go. To reach regulating collar, take off dust cap (S). There is a hook that holds it. Unhook it.

Start the motor in usual manner.

Open the throttle and advance spark slowly.

Turn down regulating collar (R) until the mixture is right when the motor is running idle. Replace dust cap (S).

If the mixture is incorrect when the power of the motor is utilized, adjust carbureter by means of adjusting lever (L—see page 31 for two-ton trucks and lever K—see page 29 for 3½, 5 and 6½ ton trucks). This adjustment will depend on the operating conditions and is determined by referring to the last paragraph on page 31, entitled "When in Need of Adjustment."

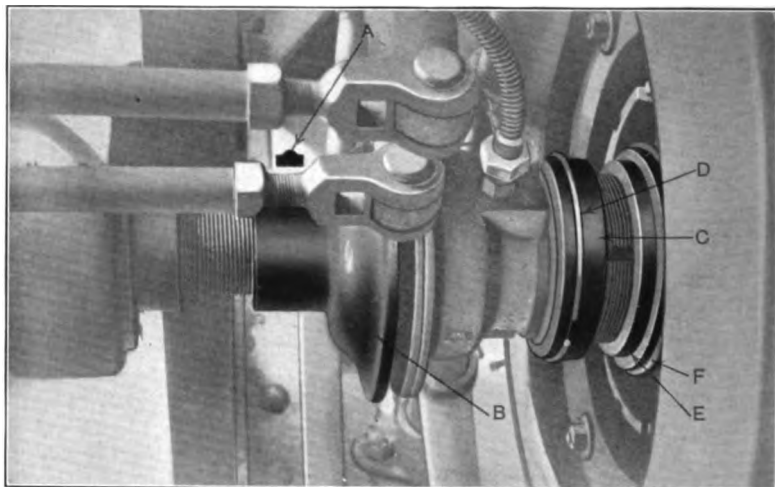
Carbureter Choked with Dirt Take off dust cap (S). There is a hook which holds it. Unhook it. Unscrew thumb screw (T). Let gasoline run out. It will carry the dirt with it. This should be done once a month.

How to Prevent Water from Entering the Carbureter Turn the valve (1—see page 29) on the small pipe which runs from the cylinder down to the carbureter. When the handle on this valve points toward the front or rear of the truck, the water is turned off.

How to Drain Water Out of Carbureter Turn the valve (1—see page 29) on the small pipe which runs from the cylinder down to the carbureter so that the water enters the carbureter. Open petcock (H—see page 29).

CLUTCH

Type A specially designed clutch is used of the dry plate type which has great flexibility.



Where to adjust the clutch

Operation When the clutch pedal is released the discs come into contact with each other. Driving discs have a high-friction, non-burn lining attached to both sides. The driven discs are made of a high-tempered saw steel.

There is a spring in the clutch which holds the discs against each other rigidly when the clutch pedal is released.

Lubrication Use no lubrication whatsoever on the clutch. The clutch discs are designed to give the best results when used dry.

Adjustment To tighten spring: Insert hook spanner wrench between clutch brake discs into holes in the adjusting sleeve. Turn adjusting sleeve to left to tighten tension of spring.

To adjust foot pedal: Take off spring (D). Turn sleeve (C). By turning sleeve (C) the position of the pedal will be raised or lowered.

To adjust distance between discs: Take off spring (F). Turn sleeve (E). This will decrease the distance between the discs. This adjustment in no way changes the position of the foot pedal.

To adjust clutch brake: Loosen bolt (A) and turn clutch brake disc (B).

COOLING SYSTEM

Importance It is important that the cooling system be in perfect operation

Unnecessary expense often results when there is lack of water in the radiator or when the fan is not working.

System Employed Water is circulated through the water jackets of the motor and the radiator by a centrifugal pump. There is a fan which circulates cool air through the radiator.

When in Need of Water or if Fan Is Not Operating

Engine overheats. Radiator steams.

How to Fill with Water Open cap on top of radiator and fill with water.

How to Drain Water Under the motor, on the left-hand side directly below the water pump, is a petcock. Open this to drain water.

Anti-Freezing Solution Fill the radiator with the following solution: Water, 64 per cent.; wood alcohol, 18 per cent.; glycerine, 18 per cent.

How to Clean Clogged Radiator Tubes Open petcock underneath water pump. Force water down the top of radiator until it comes out of the petcock under water pump.

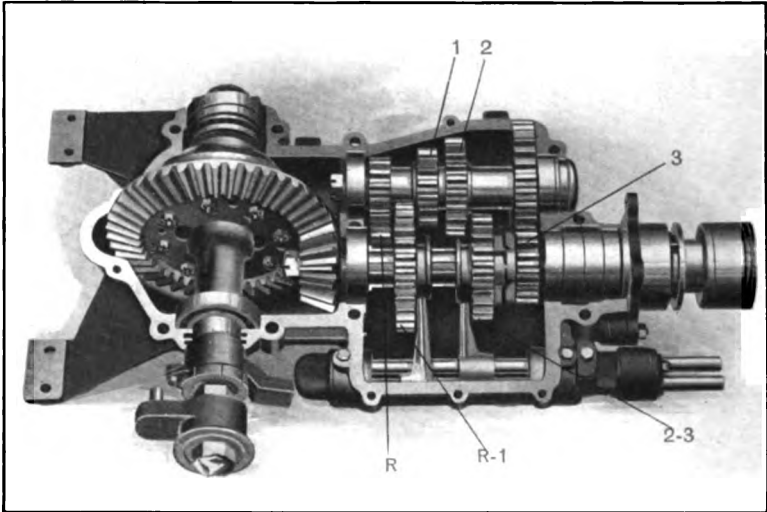
STEERING GEAR

When in Need of Adjustment When there is lost motion or considerable play in the steering wheel—when the steering wheel can be turned any distance without the turning of the wheels of the truck.

How to Adjust This should be done by the local Alco dealer or some other expert mechanic. Do not attempt to do this yourself unless you are thoroughly familiar with it.

TRANSMISSION

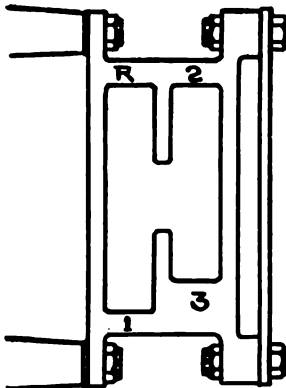
What It Is The transmission is the assembly of the gears through which the different speeds are obtained. This also includes the differential—the mechanism that makes the outside wheel, in rounding corners, go faster than the inside one.



Transmission

R—Reverse driving gear
R-1—Reverse and first speed driven gear
1—First speed driving gear

2—Second speed driving gear
2-3—Second and third speed driven gear
3—Third speed driving gear



Gear shift lever quadrant
R—Reverse 1—First speed
2—Second speed
3—Third or high speed

Through the bringing of certain gears into contact, the different speeds, also the reverse, are obtained.

As the gear shift lever is pushed back and forth into the different slots, corresponding gears come into mesh or contact.

For instance, upon pushing the gear shift lever into slot R, gears marked (R) and (R) come into mesh. Gears marked (1) and (1) mesh upon first speed. Gears (2) and (2) mesh on second speed and gears (3) and (3) on high.

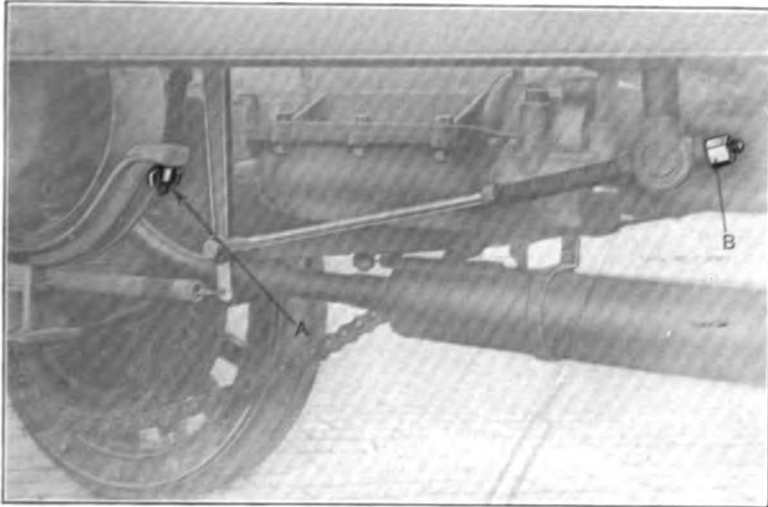
Lubrication (See page 19.)

BRAKES

Where Situated There are two sets of brakes which work independently.

One of these sets is on the jackshafts—a brake on each shaft of the contracting type.

The other is in drums on each of the rear wheels. It is of the expanding type.



Where to adjust the foot brake

How Operated The brakes on the jackshafts are operated by the foot pedal and are known as the foot brakes.

The ones in the drums in the rear wheels are operated by the hand lever and are known as hand brakes. These are applied in emergencies and when the truck is idle for a period of time.

When in Need of Adjustment Fail to hold the wheels.

How to Adjust

Foot brakes -

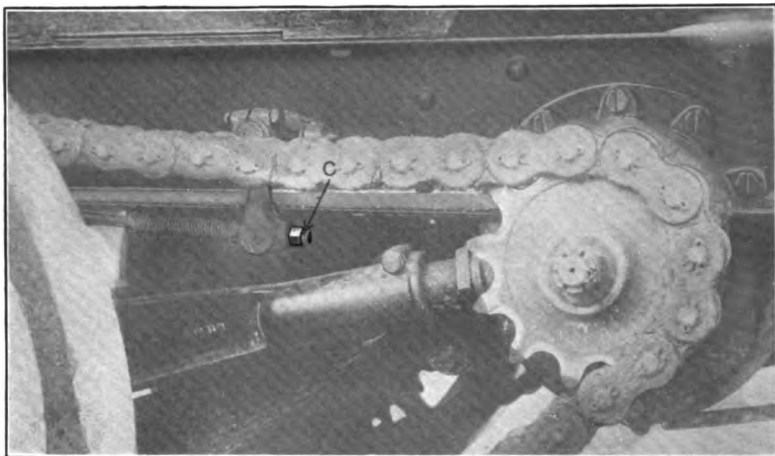
On side rods.

By thumb screws (A) attached to the toggle motion.

By adjusting screw (B) on the rear of the lower brake carrier.

Hand brake—

By self-locking nut (C) on either side of the truck, alongside of the driving sprockets. This should be turned to the right.



Where to adjust the hand brake

To Replace Brake Lining

The service brakes, that is, the foot brakes, are lined with a high-friction, non-burn material. These brakes are powerful and quick-acting, and operate no matter in what direction the truck is going. When the brakes wear it is necessary to replace only the brake lining. This is done in the following manner:

Foot Brakes: Remove the cotter pins and brake shoe pins from each end of both the upper and the lower brake shoe. Unscrew thumb screw (A). The brake shoes will now part, and the lining can be easily replaced.

Hand Brakes: To replace the lining on the hand brakes, it is necessary to take off the rear wheels. To take off the rear wheel, disconnect the chain by pulling the cotter pin out of one of the links and thus disconnecting the link. The chain now comes off.

Unscrew and take off the hub cap. Pull out the cotter pin. Unscrew the nut and pull off the wheel.

Before attempting to take off the wheel, the wheel should be raised off the ground by jacking up the truck under the rear axle. The truck should be properly braced so that it will be rigid when the wheel is off.

The lining is now exposed and can be replaced with the brake shoes on the truck.

By merely removing the brake-shoe pins, the brake shoes can be easily removed to a bench and the lining placed on the brake shoes.

DON'TS

- Don't begin the day's work without replenishing with **gasolene** and **water**.
- Don't begin the day's work without attention to the **lubrication**.
- Don't start the motor until the gear shifting lever is in a **neutral position** and the **hand brake** is on.
- Don't attempt to start with the **hand brake** applied.
- Don't advance the **spark lever** too far when **cranking motor**. You may be injured.
- Don't shift gears without first releasing the **clutch**.
- Don't start by jerks and pass unevenly into the different speeds. It causes unnecessary strain on the motor.
- Don't speed the truck under a heavy load.
- Don't overload the truck.
- Don't continue running if you detect an unusual noise. Investigate the cause.
- Don't neglect squeaking parts. Oil them.
- Don't allow bolts to remain loose, nor any parts to rattle. Tighten them.
- Don't tamper with parts or make adjustments until you are certain about the trouble.
- Don't race the motor to the extent of the governor.
- Don't start the day's work with the motor not running properly. Locate the trouble before anything more serious happens.
- Don't use an inferior grade of lubricating oil. It causes carbon deposits on the piston heads, spark plugs and combustion chamber walls.
- Don't attempt to climb steep grades on high gear. If a pounding occurs, change immediately to a lower gear.
- Don't let the motor run when you leave your truck for any length of time. This not only saves you **gasolene** and **oil**, but protects you should anyone tamper with the gear shifting lever while you are gone.
- Don't forget to clean your **spark plugs**. The gap between the points should be 1-32 of an inch.
- Don't, under any circumstances, run the motor at a high speed with the governor off.
- Don't allow the spring clips to get loosened. Always keep them tight.
- Don't start with the throttle wide open.
- Don't allow the motor to run with a retarded spark.

CARE OF A MOTOR TRUCK

A motor truck, like a horse, is sensitive to the human touch.

To get the most work out of a horse he must be well fed and well cared for. This is true also of the motor truck.

It is a recognized fact that nine-tenths of the troubles which occur in a motor truck are due to neglect on the part of the driver.

That's why this book has been prepared. Every detail has been gone into so carefully in order that the driver may become not only an Alco enthusiast, but a student of his truck.

Before a locomotive engineer goes on a trip, however short it may be, he gives attention to the working mechanism, testing the parts that wear, oiling where lubrication is needed, and so on.

The same applies to any piece of machinery. It explains why machines that are subjected to strain and friction, for instance, run constantly in oil or other substance that minimizes the wear upon them.

To get the best results from the motor truck, close attention should be paid to the lubrication.

It is an essential factor in successful operation of your Alco.

Don't be afraid to use oil on the truck.

Follow out the schedule on page 15 carefully.

It will save you money in spare parts and wear.

Lubrication is to the motor truck as food is to the horse.

Along with lubrication the importance of inspection is here emphasized.

Inspect the motor truck every night for loose nuts or bolts or parts. Tighten them up.

Spend a little time on your truck every night; the truck will do a better day's work to-morrow if you do.

Polish the brass parts every day.

Wipe the dirt off the motor.

Test the compression of the cylinders now and then to see that they are equal.

Clean the spark plugs once or twice a season.

Inspect the grease cups to see that they contain lubricant.

Wash the truck at least once a week.

Drain oil from the reservoir in the motor every 300 miles and fill with new lubricant.

Give the truck careful inspection at least once every week.

Grind the valves once or twice every season.

See that the ignition contact points are kept clean.

When the batteries show weakness renew them.

If you do it to-day, the truck will do better work to-morrow.

LOADING A MOTOR TRUCK

Balancing the load is a big factor in the successful operation of a motor truck.

Do not place all the heavy articles on the rear of the truck.

If you place a heavy article on the rear of the truck, place an article of like weight on the front also.

Do not place the load on one side of the truck.

If the load is small, place it in the center.

If you have a small and heavy load, such as steel rails, use a small body.

Have the body constructed so that the load will be centered.

There was one case of a large dealer in structural steel supplies who used a platform body which extended over the wheels. The truck pulled up to the loading platform sidewise. The shipping department employees, as a matter of convenience, loaded the steel on one side. Of course, the springs on this side were weakened. The tires also showed abnormal wear on that side.

Another concern had a tank body fitted to its truck. The tank was so big for the chassis that, on going over rough roads, the liquid went from side to side. Naturally, the springs became less resilient.

If a tank body is used to haul over rough roads, it should be made only large enough to carry a normal load.

Some drivers are unnecessarily hard on tires. The position of the load on the truck has a good deal to do with the wear. Balancing the load not only saves the tires and springs but the driving mechanism also.

Don't overload the truck. If the body is too big, don't load it to its capacity.

Wear and tear, from poor loading of the truck, may not be evident at the moment.

When a horse is overloaded, he will not start. The load has to be taken off until he is able to proceed.

When the power is applied in a motor truck, the truck will move no matter what the load may weigh. It will do so even if greatly overloaded.

But at the end of the season, when the truck is overhauled, poor judgment in loading tells. There will probably be many parts to replace that should not have been replaced for many seasons.

REGULATION OF STREET TRAFFIC

A truck, except when passing a vehicle ahead, should keep as near the right-hand curb as possible.

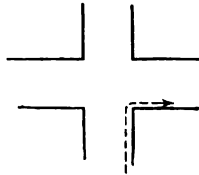
A truck meeting a vehicle should pass on the right.

A truck overtaking a vehicle should pass on the left side of the overtaken vehicle, and not pull over to the right until entirely clear of it.

On an avenue or street, divided by a parkway, walk, sunkenway or viaduct, vehicles should keep to the right hand.

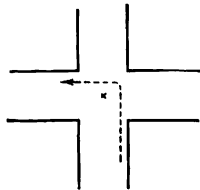
A truck turning into another street to the right should turn the corner as near the right-hand curb as practicable.

Thus:

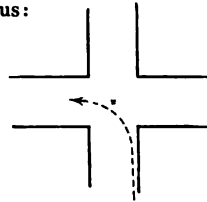


A truck turning into another street to the left should turn around the corner of the intersection of the two streets.

Thus:

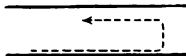


Not thus:

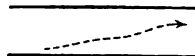


A vehicle crossing from one side of the street to the other should do so—

Thus:



Not thus:



No vehicle should stop with its left side to the curb.

No vehicle, unless in an emergency or to allow another vehicle or a pedestrian to cross its path, should stop in any public highway, except near the right-hand curb. The vehicle should never obstruct a crossing.

In slowing up or stopping, a signal should be given to those behind by raising the hand vertically.

ALCO SERVICE

From time to time the General Service Department or the local Alco dealer will send one of its expert mechanics to inspect your truck.

He will go over it carefully.

He will give your truck operator instructions and pointers on the operation of your Alco.

He will make your truck operator more efficient.

If your truck meets with an accident, don't tinker with it. Send for the nearest Alco dealer. A list will be found on page 46.

Or, if you are not located near a dealer, write to the General Service Department at 1886 Broadway, New York. It will have the nearest Alco dealer call on you, or one of its expert mechanics.

Get the most out of your Alco with the least possible cost to yourself.

The Transportation Cost Bureau will assist you.

It will reroute your hauls.

This Bureau will show you how to save time in loading and unloading.

It will improve your delivery system—make it more efficient.

Know what your Alco is costing you. Don't merely keep a record of what the gasoline, oil, grease, etc., are costing. Keep a record of expense down to the smallest detail.

The Transportation Cost Bureau has issued forms. On these forms is kept every little item of expense, arranged so that each day's costs are put down separately for the month.

At the end of the month, the total cost may be easily obtained.

Write for these sheets.

They will be sent in duplicate. You keep the original. The duplicate is sent to the Transportation Cost Bureau, 1886 Broadway, New York.

This bureau will go over them carefully; will tell you just where your costs are running too high; will tell you where your delivery system is deficient and, if possible, how to remedy these defects.

There should be no hesitancy on your part in calling upon the Service Department when you feel that you need its assistance.

Remember that it is far better to take care of your truck or to have it cared for, than to let it run along unattended to.

As you become more proficient in driving and your knowledge of the mechanism increases, less advice, naturally, will be needed.

This book covers the ground thoroughly, but there are times when matters can be better understood by personal consultation.

The service of the General Service Department and the Transportation Cost Bureau is part of what you receive when you buy an Alco truck.

COMMERCIAL VEHICLE LAWS

STATE	REGISTER WITH	Date of Registration	No. of Plates Issued	COST 2 Ton 3½ Ton 5 & 6½ Ton	EXTRAS 50c. per H.-P.	Cost of Owner's License to Drive
Alabama	Secretary of State	October 1st	2	\$17.50	\$20.00	.....
Arkansas	Secretary of State	January 1st	1	5.00	5.00	.....
California	Secretary of State	January 1st	1	2.00	2.00	.....
Connecticut	Secretary of State	January 1st	2	11.00	11.00	\$2.00
Delaware	Secretary of State	January 1st	2	5.00	5.00	5.00
District of Columbia	Automobile Board	January 1st	1	2.00	2.00	2.00
Florida	Secretary of State	January 1st	1	2.00	2.00	.....
Illinois	Secretary of State	January 1st	2	6.00	10.00	\$15.00
Indiana	Secretary of State	January 1st	2	1.00	1.00	.....
Iowa	Secretary of State	January 1st	2	12.00	16.00	.....
Kansas	Secretary of State	January 1st	2	10.00	10.00	2.00
Maine	Secretary of State	January 1st	2	10.00	10.00	.....
Kentucky	Secretary of State	January 1st	2	12.00	12.00	2.00
Maryland	Com. of Motor Vehicles	January 1st	2	15.00	25.00	2.00
Massachusetts	Highway Commissioner	January 1st	2	3.00	3.00	.....
Michigan	Secretary of State	January 1st	2	1.50	1.50	.....
Minnesota	Secretary of State	Every 3 years	2	5.00	7.00	.....
Missouri	Secretary of State	January 1st	2	10.00	10.00	.....
Montana	Secretary of State	January 1st	2	5.00	5.00	.....
New Hampshire	Secretary of State	January 1st	2	10.00	10.00	.....
New York	Secretary of State	February 1st	2	5.00	5.00	.....
New Jersey	Com. of Motor Vehicles	January 1st	2	5.00	5.00	.....
North Carolina	Secretary of State	January 1st	2	3.00	3.00	.....
North Dakota	Secretary of State	January 1st	2	5.00	5.00	.....
Ohio	Secretary of State	January 1st	2	5.00	7.50	2.00
Oregon	Secretary of State	January 1st	2	10.00	15.00	1.00
Pennsylvania	State Highway Department	January 1st	2	1.00	1.00	.....
Rhode Island	State Board of Public Roads	January 1st	2	1.00	1.00	.....
South Carolina	Secretary of State	January 1st	1	2.00	2.00	.....
South Dakota	Secretary of State	January 1st	2	5.00	5.00	.....
Tennessee	County Clerk	January 1st	1	2.00	2.00	.....
Texas	Secretary of State	January 1st	1	32.00	40.00	2.50
Utah	Secretary of State	January 1st	2	10.00	10.00	.....
Vermont	Secretary of State	January 1st	1	2.00	2.00	.....
Virginia	Secretary of State	January 1st	1	2.00	2.00	.....
Washington	Secretary of State	January 1st	1	2.00	2.00	.....
West Virginia	State Auditor	January 1st	1	2.00	2.00	.....
Wisconsin	Secretary of State	January 1st	1	2.00	2.00	.....

CHAUFFEUR'S LICENSE LAWS

STATE	FEES	LAW	
Alabama.....	\$5.00	Annual with Secretary of State. Application must be accom-	Badge must be worn.
Arkansas.....	Renewal \$2.50	panied by endorsement of 3 reputable Motor Vehicle owners.....	Badge must be worn.
California.....	\$1.00	Annual with Secretary of State.....	Badge must be worn.
Connecticut.....	2.00	Annual with Secretary of State.....	Badge must be worn.
Delaware.....	2.00	Annual with Secretary of State.....	Badge must be worn.
District of Columbia.....	5.00	Annual with Secretary of State.....	Badge must be worn.
Florida.....	2.00	Annual with Auto Board. (Examination.).....	Badge must be worn.
Illinois.....	2.00	Annual with Secretary of State.....	Badge must be worn.
	5.00	Annual with Secretary of State.....	Badge must be worn.
	Renewal \$3.00		
Maine.....	\$2.00	Annual with Secretary of State.....	Badge must be worn.
Maryland.....	2.00	With Secretary of State.....	Badge must be worn.
Massachusetts.....	2.00	Annual with Highway Commissioners.....	Badge must be worn.
	Renewal 50c.		
Michigan.....	\$2.00	Annual with Secretary of State.....	Badge must be worn.
Minnesota.....	3.00	Annual with Board of Auto Examiners.....	Badge must be worn.
Missouri.....	1.50	Annual with Secretary of State.....	Badge must be worn.
New Hampshire.....	5.00	Annual with Secretary of State. (Examination.).....	Badge must be worn.
	Renewal \$1.00		
New York.....	\$5.00	Annual with Secretary of State. (Examination.).....	Badge must be worn.
	Renewal \$2.00		
New Jersey.....	\$4.00	Annual with Commissioner of Motor Vehicles.....	Badge must be worn.
Ohio.....	2.00	Annual with Secretary of State.....	Badge must be worn.
Oregon.....	2.00	Annual with Secretary of State.....	Badge must be worn.
Pennsylvania.....	2.00	Annual with Secretary of State.....	Badge must be worn.
Rhode Island.....	1.00	Annual with State Board of Public Roads.....	Badge must be worn.
Utah.....	2.00	Annual with Secretary of State.....	Badge must be worn.
Vermont.....	2.00	Annual with Secretary of State.....	Badge must be worn.
Virginia.....	2.50	Annual with Secretary of State.....	Badge must be worn.
West Virginia.....	2.00	With State Auditor.....	Badge must be worn.

Alco Branches

Boston, Mass.....American Locomotive Company, 567 Boylston Street
Service Station: Shoe & Leather Exhibition Bldg., Cambridge, Mass.
Chicago, Ill.....American Locomotive Company, 2501 Michigan Ave.
Montreal, Canada.....Montreal Locomotive Works, Limited, 4280 St. Catherine Street, W.
Philadelphia, Pa.....American Locomotive Company, 2126 Market Street
Providence, R. I.....American Locomotive Company
New York, N. Y.....American Locomotive Company, 1886 Broadway
Service Station: 630 Jackson Avenue, Long Island City

Pacific Coast Service Stock Station

San Francisco, Cal.....American Locomotive Sales Corporation, 435 Turk Street

Alco Dealers

Asheville, N. C.....Asheville Auto Co., 15 Lexington Avenue
Asbury Park, N. J.....Mark Guy, 21 Main Street
Atlanta, Ga.....Walraven & Nabors, 225 Peachtree Street
Baltimore, Md.....Neely & Ensor, Mt. Royal Avenue and McMechen Street
Binghamton, N. Y.....H. T. Rogers, 181 Court Street
Bridgeport, Conn.....Erwin M. Jennings Co., 277 Fairfield Avenue
Buffalo, N. Y.....Co-operative Motor Car Co., 889 Main Street
Chattanooga, Tenn.....Auto Repair Co., 3 Boyce Street
Cincinnati, Ohio.....Peters & Keiding, 123 East 7th Street
Clarksburg, W. Va.....Johnston-Ransome Auto Co.
Cleveland, Ohio.....Alco Motor Co. of Cleveland, 1914 Euclid Avenue
Danville, Ill.....N. E. Holden
Decatur, Ill.....Augustus E. Staley
Denver, Colo.....W. W. Barnett, 1314 Lincoln Street
Des Moines, Iowa.....Commercial Motors Company, 10th and Murphy Streets
Detroit, Mich.....Thompson Auto Co., 972 Woodward Avenue
Dubuque, Iowa.....Dubuque Rambler Auto & Supply Co.
Duluth, Minn.....E. L. Bradley, 207 Palladio Bldg.
Durham, N. C.....E. B. Lyon Motor Car Co.
Edmonton, Canada.....Taylor-Musson Co.
Erie, Pa.....Star Garage Co., 609 French Street
Grand Rapids, Mich.....E. A. Merrill
Harrisburg, Pa.....Andrew Redmond
Honolulu, T. H.....Royal Hawaiian Garage Co.
Houston, Texas.....Alco Auto Sales Co., 111 Main Street
Jacksonville, Fla.....Wiesenfeld Warehouse Co., Ft. Newman Street
Johnstown, Pa.....Johnstown Automobile Co.
Kansas City, Mo.....Williams Motor Car Co., 16th and Walnut Streets
Lancaster, Pa.....B. Franklin Futer, 215 N. Prince Street

Los Angeles, Cal. Los Angeles Alco Motor Sales Co., 1246 So. Flower Street
Manila, P. I. E. C. McCullough & Co.
Memphis, Tenn. Tri-State Chalmers Co., Monroe Street
Miami, Fla. Charles Jones
Minneapolis, Minn. P. J. Downes Co.
Mobile, Ala. Bloch Bros., 9 N. Water Street
Murfreesboro, Tenn. Christy & Huggins Co.
Newark, N. J. F. A. Champlin, 293 Halsey Street
Newburgh, N. Y. Youngs & Co., 249 Grand Street
New Haven, Conn. W. A. Maynard Co., 45 High Street
New Orleans, La. H. A. Testard, 353 Baronne Street
Omaha, Neb. Jack Sharp, c/o Omaha Transfer Co.
Palatka, Fla. Palatka Automobile & Supply Co.
Paterson, N. J. Hughes Garage Co., 49 Prospect Street
Peekskill, N. Y. W. H. Ash, 224 Washington Street
Pine Bluff, Ark. Hearn Auto Co.
Pittsfield, Mass. C. C. Gamwell
Pittsburgh, Pa. Alco Pittsburgh Sales Co., 5971 Center Avenue
Punxsutawney, Pa. South Shore Construction Co.
Richmond, Va. Eastern Motor Sales Corp., 920 W. Broad Street
Salt Lake City, Utah. Salt Lake City Auto Company
San Francisco, Cal. Auto Sales Co., 418 Golden Gate Ave.
Savannah, Ga. John J. McDonough, 110 Congress St., E.
Schenectady, N. Y. Clark Witbeck, 416 State Street
Scranton, Pa. L. M. & C. A. Connell, Connell Bldg.
Seattle, Wash. Metropolitan Motor Car Co., 1315 5th Avenue
Spokane, Wash. Metropolitan Motor Car Co., 1318 2d Avenue
Steubenville, Ohio. Collins Bros., 517 Market Street
St. Louis, Mo. Missouri Motor Car Co., 3007 Locust Street
Springfield, Mass. Morse-Readio Auto Co., 34 Sanford Street
Syracuse, N. Y. W. R. Shaw, 223 W. Genesee Street
Tampa, Fla. Chas. H. Moorhouse
Toledo, Ohio. Dennis Motor Co.
Trenton, N. J. Brock's Garage, Inc., Canal Street, at State Street
Utica, N. Y. F. P. Miller Motors Corporation, Fay and Warren Streets
Vancouver, B. C. Hoffmeister Bros., Limited, 1155 Pender Street, W.
Washington, D. C. Motor Truck Corp.
Watertown, N. Y. Edwards Auto Company
Wilmington, Del. Wilmington Auto Co., Delaware Avenue and 10th Street
Winnipeg, Canada. Canadian Motor Co., Limited
Wheeling, W. Va. Jason C. Stamp
Youngstown, Ohio. Youngstown Auto & Repair Co.

CONTENTS

	PAGE
Alco Dealers	46
Alco Service	43
Anti-Freezing Solution	35
Brakes	37-38
Adjustments	37
Location	37
Operation	37
To replace lining	38
Carbureter	31-33
Adjustments	31-33
How to drain water	33
How to shut off water	33
Troubles and remedies	31-33
When right mixture is obtained	33
Care of Motor	21
Care of Motor Truck	40
Chauffeur License Laws	45
Clutch	34
Clutch Slips	24
Commercial Vehicle License Laws	44
Compression	22
How to test	22
Loss of	22
Release	22
Cooling System	35
Anti-freezing solution	35
How to clean clogged radiator tubes	35
How to drain water	35
How to fill radiator	35
When in need of water	35
Cylinder Missing	25
(See Motor, page 21-22)	
Dealers	46
Don'ts	39
Emergency Gasolene Reservoir	30
Engine Refuses to Start	23
Engine Runs Smoothly, but Truck Drags	25
Engine Stops Suddenly	24
Explosions in Muffler	24
Firing Sequence	26
Gasolene System	29
Emergency reservoir	30
Gasolene tank capacity	29
Gasolene tank location	29
How to drain gasolene tank	29
How to fill gasolene tank	29
How to tell when gasolene pipe is running free	30
How to turn off gasolene	29
How to turn on gasolene	29
Gasolene Tank	29
Capacity	29

CONTENTS—Continued

Gasolene Tank—Continued	PAGE
Emergency reservoir.....	30
How to drain.....	29
How to fill.....	29
Location.....	29
Grinding Valves.....	22
Ignition.....	26-28
Battery.....	27
How to connect together.....	27
Location.....	27
When in need of new battery.....	27
Firing sequence.....	26
Magneto.....	28
Spark plugs.....	27-28
Care.....	28
How to clean.....	27
Troubles and remedies.....	27
Loading the Truck.....	41
Loss of Compression.....	24
Lubrication.....	14-20
Instructions.....	15
Motor.....	16-19
How to drain.....	19
How to fill.....	19
How to tell when in need of oil.....	19
System.....	17
Transmission.....	19-20
How to drain.....	20
How to fill.....	20
How to tell when in need of oil.....	20
Kind of oil.....	19
System.....	19
Wheels.....	20
Magneto.....	28
Motor.....	21-22
Care.....	21
Compression.....	22
Grinding valves.....	22
Lubrication.....	17
Principle.....	21
Removing carbon.....	22
Removing valves.....	22
Motor Knocks.....	23
Motor Overheats.....	23
Motor Smokes.....	23
Muffler Explosions.....	24
Operate the Truck, How to.....	7-12
Racing Motor.....	12
Radiator.....	35
Anti-freezing solution.....	35
How to clean clogged tubes.....	35
How to drain.....	35
How to fill.....	35

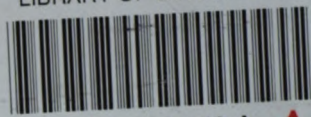
CONTENTS—Continued

	PAGE
Receiving the Truck.....	4-6
Regulations—Street Traffic.....	42
Remove Carbon, How to.....	22
Remove Valves, How to.....	22
Service.....	43
Spark Plugs.....	27-28
Care.....	28
How to clean.....	27
Troubles and remedies.....	27
When in need of cleaning.....	27
Where located.....	27
Start Motor, How to.....	7
Stop Motor, How to.....	12
Steering Gear.....	35
Timing Valves.....	22
Transmission.....	36
Troubles and Remedies.....	23-25
Unloading Truck from Freight Car.....	4
Valve Adjustments.....	22
How to grind.....	22
How to remove.....	22
How to remove carbon.....	22
How to time.....	22
What to Do Every Morning.....	13
Wheels.....	20
How to take off.....	20
How to lubricate.....	20





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